

# East Waterway OU

## Draft Anthropogenic Background Problem Definition and Goals

### *State the Problem*

CERCLA guidance describes the importance of contaminants of concern (COC) background concentrations in risk characterization and risk communication (EPA, 1989; EPA 2002a, 2002b). In the CERCLA process, background concentrations are important for developing remediation goals and are used to assess remedy performance following remediation. CERCLA-defined background concepts apply to the East Waterway Operational Unit (EW) of the Harbor Island Superfund Site. EPA's 1989 guidance defines the background concepts as follows:

- **Natural Background:** substances present in the environment in forms that have not been influenced by human activity.
- **Anthropogenic Background:** natural and human-made substances present in the environment as a result of human activities (not specifically related to the CERCLA release in question).

The EPA-approved Supplemental Remedial Investigation (SRI; Windward 2014) calculated risk-based threshold concentrations for PCBs, dioxins/furans, and arsenic for human health remedial action objectives (RAOs) that were below natural background concentrations. Therefore, preliminary remediation goals (PRGs) developed in the Feasibility Study (FS; Anchor QEA 2019) were set to natural background values for these three COCs and associated RAOs. These are provided below (see FS Table 4-3):

- Total PCBs: 2 µg/kg dw; RAO 1 (Human health seafood consumption)
- Dioxins/furans: 2 ng/kg TEQ dw; RAO 1 (Human health seafood consumption)
- Arsenic: 7 mg/kg dw; RAO 2 (Human health direct contact)

As outlined in Appendix A of the EW FS, natural background concentrations for these three COCs are not achievable for EW. Therefore, anthropogenic background for these COCs is needed to establish associated cleanup levels. Sediments accumulating in the EW contain concentrations of these COCs above natural background that are not related to EW sources. This includes inputs from upstream Green River as well as general urban runoff. For example, off-site upland area impervious surfaces generate stormwater runoff, and discharges from storm sewers, combined sewer overflows, and other non-point sources that contribute solids to the EW, which are relevant given the urban setting. EPA guidance (2018) also states that "the CERCLA program normally does not set cleanup levels below anthropogenic background concentrations [...due to] cost-effectiveness, technical practicability, and the potential for recontamination of remediated areas by surrounding areas with

elevated background concentrations.” Because EW is located in an urban area, anthropogenic background is influenced by both general urban inputs of the drainage basin as well as upstream inputs.

The focus of this evaluation is to determine if available data are sufficient to support estimating anthropogenic background concentrations for these three COCs. Establishment of anthropogenic concentrations will allow EPA to issue a final Record of Decision (ROD).

The EW FS describes the conceptual site model (CSM), including the sources of sediment that accumulate in the EW. The vast majority of suspended sediments that accumulate in the EW originate from the Green River. Smaller portions of suspended sediment with higher concentrations originate from 1) lateral inputs, such as storm drains and CSOs, entering the EW along the EW itself, 2) lateral inputs along the Lower Duwamish Waterway (LDW) that flow downstream into the EW, and 3) LDW bed sediments that are resuspended and move downstream into the EW. Other factors that affect the long-term site-wide sediments concentrations in the EW include sediment that remains in the EW that cannot be actively remediated through removal, capping, treatment, or enhanced natural recovery.

### *Goals of this Evaluation*

The EW FS CSM provided estimates of sediment mass and COC concentrations for each input to the EW. Subsequent to the FS, additional data have been generated that provide more information on sediment input concentrations to the EW. Therefore, **the main purpose of this evaluation is to assess whether existing data are sufficient for estimating EW anthropogenic background values for total PCBs, dioxin/furans, and arsenic.**

To achieve this overarching purpose, the following specific goals have been identified:

1. Review the relative contribution of each type of sediment input to the EW based on the conceptual site model (CSM)
2. Identify and evaluate available concentration data for total PCBs, dioxin/furans, and arsenic for each of the sediment inputs to the EW
3. Determine if available data is acceptable and adequate to develop anthropogenic background concentrations for total PCBs, dioxin/furans, and arsenic
4. Develop a data analysis approach for estimating anthropogenic background concentrations

## *Citations*

US EPA. 1989. Risk assessment guidance for Superfund volume I human health evaluation manual (part A), interim final. Washington (DC): USEPA Office of Emergency and Remedial Response. EPA/540/1-89/002.

U.S. Environmental Protection Agency (EPA), 2002a. Role of Background in CERCLA Cleanup Program. Office of Solid Waste and Emergency Response. Office of Emergency and Remedial Response. OSWER 9285.6-07P. April 26, 2002.

US EPA. 2002b. Guidance for comparing background and chemical concentrations in soil for CERCLA sites. Washington (DC): Office of Emergency and Remedial Response. OSWER 9285.7-41, EPA 40-R-01-003.

US EPA. 2018. "Frequently Asked Questions About the Development and Use of Background Concentrations at Superfund Sites: Part One, General Concepts." OLEM 9200.2-141 A.